SEQUENCE LISTING

<110> Meiji Seika Kaisha, Ltd.

<120> Cyclic depsipeptide synthetase and its gene and mass production system of cyclic depsipeptide

<130> 127184

<150> JP 253040/1999
<151> 1999-09-07

<150> JP 104291/2000
<151> 2000-04-06

<160> 21

<170> PatentIn Ver. 2.1

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| cta | tca | ctt | tca | tgc | ccc | tta | ctc | cct | cat | gac | gat | gag | aaa | cac | tca | 96 |
| Leu | Ser | Leu | Ser | Cys | Pro | Leu | Leu | Pro | His | Asp | Asp | Glu | Lys | His | Ser | |

15   20   25

| gac | aac | ctt | tac | gag | caa | gca | act | cgg | cac | ttc | ggc | ttg | agc | cga | gac | 144 |
| Asp | Asn | Leu | Tyr | Glu | Gln | Ala | Thr | Arg | His | Phe | Gly | Leu | Ser | Arg | Asp | |

30   35   40

| aag | atc | gaa | aat | gtc | tta | cca | tgt | act | tcc | ttt | caa | tgt | gat | gtc | ata | 192 |
| Lys | Ile | Glu | Asn | Val | Leu | Pro | Cys | Thr | Ser | Phe | Gln | Cys | Asp | Val | Ile | |

45   50   55   60

| gat | tgc | gcc | gtc | gac | gat | cgg | cgg | cat | gct | atc | ggt | cac | gtc | gtc | tat | 240 |
| Asp | Cys | Ala | Val | Asp | Asp | Arg | Arg | His | Ala | Ile | Gly | His | Val | Val | Tyr | |

65   70   75

| gat | atc | ccc | aat | aca | gtg | gac | atc | cag | cgt | tta | gcc | gca | gcc | tgg | aaa | 288 |
| Asp | Ile | Pro | Asn | Thr | Val | Asp | Ile | Gln | Arg | Leu | Ala | Ala | Ala | Trp | Lys | |

80   85   90

| gag | gtt | gtg | cgg | cag | aca | cca | atc | ttg | agg | acc | ggc | atc | ttt | aca | tca | 336 |

Glu Val Val Arg Gln Thr Pro Ile Leu Arg Thr Gly Ile Phe Thr Ser
    95   100   105

gaa acc ggc gac tct ttt cag atc gtc ttg aaa gaa ggc tgc cta ccg   384
Glu Thr Gly Asp Ser Phe Gln Ile Val Leu Lys Glu Gly Cys Leu Pro
    110   115   120

tgg atg tac gcg aca tgt ctc ggc atg aag ggg gca gtg ata caa gat   432
Trp Met Tyr Ala Thr Cys Leu Gly Met Lys Gly Ala Val Ile Gln Asp
125   130   135   140

gaa gca gtc gcc gct atg act gga ccg cgt tgc aat cga tat gtc gtc   480
Glu Ala Val Ala Ala Met Thr Gly Pro Arg Cys Asn Arg Tyr Val Val
        145   150   155

ctg gag gac ccg agt acg aag caa agg ctg ctc atc tgg aca ttc agc   528
Leu Glu Asp Pro Ser Thr Lys Gln Arg Leu Leu Ile Trp Thr Phe Ser
    160   165   170

cat gct tta gtg gat tat aca gtc cag gaa cgc atc ctt cag cgg gtt   576
His Ala Leu Val Asp Tyr Thr Val Gln Glu Arg Ile Leu Gln Arg Val
    175   180   185

ctc aca gta tac gac ggc cgg gac gtc gag tgc cct cgc atc aag gat   624
Leu Thr Val Tyr Asp Gly Arg Asp Val Glu Cys Pro Arg Ile Lys Asp
    190   195   200

aca gaa cat gtc tct cgg ttt tgg caa caa cac ttt gaa ggc tta gat   672
Thr Glu His Val Ser Arg Phe Trp Gln Gln His Phe Glu Gly Leu Asp
205   210   215   220

gcc tcc gta ttt ccc ctt cta cca tct cac cta act gtg tgc aat ccc   720
Ala Ser Val Phe Pro Leu Leu Pro Ser His Leu Thr Val Cys Asn Pro
            225   230   235

aat gcg cgc gca gaa cat cat atc tca tac acg gga cca gtc cag agg   768
Asn Ala Arg Ala Glu His His Ile Ser Tyr Thr Gly Pro Val Gln Arg
            240   245   250

aag tgg tcc cat aca agt atc tgt cgg gct gca ctc gca gtt ctt cta   816
Lys Trp Ser His Thr Ser Ile Cys Arg Ala Ala Leu Ala Val Leu Leu
            255   260   265

tct cgc ttt aca cac tct tcg gag gcc ctc ttc ggt gtt gtg aca gaa   864
Ser Arg Phe Thr His Ser Ser Glu Ala Leu Phe Gly Val Val Thr Glu
270   275   280

caa tct cac aac tcc gag gac caa aga cgg tca att gat ggc ccc gca   912
Gln Ser His Asn Ser Glu Asp Gln Arg Arg Ser Ile Asp Gly Pro Ala
285   290   295   300

agg aca gta gtg cct atc cgc gtc ctt tgt gcc cca gat caa tat gtg   960
Arg Thr Val Val Pro Ile Arg Val Leu Cys Ala Pro Asp Gln Tyr Val
            305   310   315

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tcg gat gtc att ggg gca atc acc gca cac gaa cac gcc atg cgc ggg     1008
Ser Asp Val Ile Gly Ala Ile Thr Ala His Glu His Ala Met Arg Gly
            320                 325                 330


ttt gag cac gct gga ctt cgc aat atc cgc cgt acc gga gac gac ggg     1056
Phe Glu His Ala Gly Leu Arg Asn Ile Arg Arg Thr Gly Asp Asp Gly
            335                 340                 345


tct gct gct tgt gga ttc cag acc gtg cta ctg gtg act gac ggt gat     1104
Ser Ala Ala Cys Gly Phe Gln Thr Val Leu Leu Val Thr Asp Gly Asp
        350                 355                 360


gct ccc aag acc cct ggg agt gta ctt cat cga agt gta gaa gaa tcg     1152
Ala Pro Lys Thr Pro Gly Ser Val Leu His Arg Ser Val Glu Glu Ser
365                 370                 375                 380


gat aga ttc atg ccc tgc gct aat cgt gcc ctt ctg ctc gac tgc cag     1200
Asp Arg Phe Met Pro Cys Ala Asn Arg Ala Leu Leu Leu Asp Cys Gln
                385                 390                 395


atg gct ggc aac tcg gca tcc cta gtc gca cga tat gat cat aat gtg     1248
Met Ala Gly Asn Ser Ala Ser Leu Val Ala Arg Tyr Asp His Asn Val
            400                 405                 410


atc gac cca cgc cag atg tct cgc ttc ctg cga cag cta gga tac ctg     1296
Ile Asp Pro Arg Gln Met Ser Arg Phe Leu Arg Gln Leu Gly Tyr Leu
            415                 420                 425
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atc caa caa ttt cat cat cac gtc gat ctg cct ctg gtc aaa gaa ctg   1344
Ile Gln Gln Phe His His His Val Asp Leu Pro Leu Val Lys Glu Leu
    430   435   440

gac gtc gtg acg gcg gag gat tgt gcg gaa atc gag aaa tgg aat tca   1392
Asp Val Val Thr Ala Glu Asp Cys Ala Glu Ile Glu Lys Trp Asn Ser
445   450   455   460

gaa cgc cta aca atg caa gac gcc tta atc cac gac acc ata tcc aag   1440
Glu Arg Leu Thr Met Gln Asp Ala Leu Ile His Asp Thr Ile Ser Lys
                 465   470   475

tgg gct gct ggc gat ccc aac aaa gct gca gtt ttc gct tgg gat ggg   1488
Trp Ala Ala Gly Asp Pro Asn Lys Ala Ala Val Phe Ala Trp Asp Gly
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gaa tgg aca tac gcc gag cta gac aac ata tcc tcc cgt ctc gcc gtg   1536
Glu Trp Thr Tyr Ala Glu Leu Asp Asn Ile Ser Ser Arg Leu Ala Val
         495   500   505

tat atc caa tcc ctg gac ttg aga cca gga caa gca ata ctc cca ctc   1584
Tyr Ile Gln Ser Leu Asp Leu Arg Pro Gly Gln Ala Ile Leu Pro Leu
    510   515   520

tgc ttc gag aag tca aaa tgg gtc gtc gcc aca att ctc gcc gtc ctc   1632
Cys Phe Glu Lys Ser Lys Trp Val Val Ala Thr Ile Leu Ala Val Leu
525   530   535   540

aaa gtc ggt cgg gca ttc aca ctc atc gac ccg tgc gac ccc tcg gca   1680
Lys Val Gly Arg Ala Phe Thr Leu Ile Asp Pro Cys Asp Pro Ser Ala
            545   550   555

agg atg gcc cag gtc tgt cag cag acc tcc gcc aca gtc gct ctc acc   1728
Arg Met Ala Gln Val Cys Gln Gln Thr Ser Ala Thr Val Ala Leu Thr
            560   565   570

tcc aaa ctc cac aac acc acc tta cgt tcc gtc gtt tcc cgc tgc att   1776
Ser Lys Leu His Asn Thr Thr Leu Arg Ser Val Val Ser Arg Cys Ile
            575   580   585

gtg gtc gac gac gac ctc ctt cgg tcc tta ccc cac gcc gat ggc cgc   1824
Val Val Asp Asp Asp Leu Leu Arg Ser Leu Pro His Ala Asp Gly Arg
        590   595   600

tta aag gcc acc gtg aag cca cag gac ttg gcc tat gtt att ttc aca   1872
Leu Lys Ala Thr Val Lys Pro Gln Asp Leu Ala Tyr Val Ile Phe Thr
605   610   615   620

tct ggc agc aca gga gag ccg aaa ggc atc atg atc gaa cat cgg ggg   1920
Ser Gly Ser Thr Gly Glu Pro Lys Gly Ile Met Ile Glu His Arg Gly
            625   630   635

ttc gtg tcg tgt gct atg aaa ttt ggc ccc gcg ctc gga atg gat gag   1968
Phe Val Ser Cys Ala Met Lys Phe Gly Pro Ala Leu Gly Met Asp Glu
            640   645   650

cac acg cgc gct ctt caa ttc gcc tca tat gcg ttt ggc gct tgt ctg   2016
His Thr Arg Ala Leu Gln Phe Ala Ser Tyr Ala Phe Gly Ala Cys Leu
      655   660   665

gta gaa gtt gtg aca gct ctg atg cac ggc ggc tgc gtc tgc atc cct   2064
Val Glu Val Val Thr Ala Leu Met His Gly Gly Cys Val Cys Ile Pro
      670   675   680

tcc gat gac gat cgc ttg aac aat gta ccg gag ttc atc aaa agg gcc   2112
Ser Asp Asp Asp Arg Leu Asn Asn Val Pro Glu Phe Ile Lys Arg Ala
685   690   695   700

cag gtg aac tgg gtg ata ctc act ccg tcg tat atc ggg aca ttc cag   2160
Gln Val Asn Trp Val Ile Leu Thr Pro Ser Tyr Ile Gly Thr Phe Gln
           705   710   715

ccg gaa gat gtc cct gga cta caa aca ctg gta ttg gtt gga gaa cct   2208
Pro Glu Asp Val Pro Gly Leu Gln Thr Leu Val Leu Val Gly Glu Pro
           720   725   730

atc tca gcg tct att cgg gat acc tgg gcc tcc cag gtt cga ctc ctg   2256
Ile Ser Ala Ser Ile Arg Asp Thr Trp Ala Ser Gln Val Arg Leu Leu
           735   740   745

aat gcc tac ggt cag agt gaa agc tca act atg tgc agc gtc acg gaa   2304
Asn Ala Tyr Gly Gln Ser Glu Ser Ser Thr Met Cys Ser Val Thr Glu
           750   755   760

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gtc agc ccg ctc tcc ctc gaa ccg aac aat atc ggt cgg gct gta ggc     2352
Val Ser Pro Leu Ser Leu Glu Pro Asn Asn Ile Gly Arg Ala Val Gly
765             770         775             780


gca cga tcc tgg atc att gat ccc gac gag cct gat cgt ctt gct cca     2400
Ala Arg Ser Trp Ile Ile Asp Pro Asp Glu Pro Asp Arg Leu Ala Pro
                785             790             795


att ggc tgc att gga gag cta gtg atc gaa agt ccg ggc att gcg cgc     2448
Ile Gly Cys Ile Gly Glu Leu Val Ile Glu Ser Pro Gly Ile Ala Arg
            800             805             810


gac tat atc atc gcg ccg ccg ccg gac aag tcc ccc ttt ctc cta gca     2496
Asp Tyr Ile Ile Ala Pro Pro Pro Asp Lys Ser Pro Phe Leu Leu Ala
            815             820             825


ccc ccg gcc tgg tat cca gcc ggg aaa tta tcc aac gcc ttt aaa ttt     2544
Pro Pro Ala Trp Tyr Pro Ala Gly Lys Leu Ser Asn Ala Phe Lys Phe
    830             835             840


tac aag act gga gat ctc gtg cgt tat gga cct gac ggc acc atc gtc     2592
Tyr Lys Thr Gly Asp Leu Val Arg Tyr Gly Pro Asp Gly Thr Ile Val
845             850             855             860


tgc ctg gga cgc aaa gat tcg caa gtg aag atc cga ggg cag cgc gta     2640
Cys Leu Gly Arg Lys Asp Ser Gln Val Lys Ile Arg Gly Gln Arg Val
            865             870             875
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gag atc agc gca gtg gaa gcc agt cta cga cga caa cta cct agt gac   2688
Glu Ile Ser Ala Val Glu Ala Ser Leu Arg Arg Gln Leu Pro Ser Asp
            880   885   890

atc atg ccc gtg gcc gaa gct atc aaa cgc tcg gat tcg tca ggc agc   2736
Ile Met Pro Val Ala Glu Ala Ile Lys Arg Ser Asp Ser Ser Gly Ser
           895   900   905

aca gtc ttg act gcc ttc ttg ata ggg tca tct aag agc gga gat ggt   2784
Thr Val Leu Thr Ala Phe Leu Ile Gly Ser Ser Lys Ser Gly Asp Gly
        910   915   920

aat ggc cac gct tta tct gcg gca gac gcc gtt atc ttg gat cac ggt   2832
Asn Gly His Ala Leu Ser Ala Ala Asp Ala Val Ile Leu Asp His Gly
925   930   935   940

gct acc aac gag ata aac gcg aag ttg cag caa atc ctt ccc cag cat   2880
Ala Thr Asn Glu Ile Asn Ala Lys Leu Gln Gln Ile Leu Pro Gln His
           945   950   955

tcc gtt cca tcc tat tat atc cac atg gaa aat ctt cct cga act gcc   2928
Ser Val Pro Ser Tyr Tyr Ile His Met Glu Asn Leu Pro Arg Thr Ala
           960   965   970

acc ggc aaa gcg gac agg aaa atg ctt cga tct att gct agc aag cta   2976
Thr Gly Lys Ala Asp Arg Lys Met Leu Arg Ser Ile Ala Ser Lys Leu
        975   980   985

ttg ggt gaa ttg tct cag aac gtg aca tct caa ccg att gag aag cac   3024
Leu Gly Glu Leu Ser Gln Asn Val Thr Ser Gln Pro Ile Glu Lys His
    990   995   1000

gat gcc cca gca act ggt ata gag gtc aag ctg aag gag ctt tgg ttt   3072
Asp Ala Pro Ala Thr Gly Ile Glu Val Lys Leu Lys Glu Leu Trp Phe
1005   1010   1015   1020

ctg agc ttg aat ctt aat ccc aac tct caa gat gtc gga gcg agt ttc   3120
Leu Ser Leu Asn Leu Asn Pro Asn Ser Gln Asp Val Gly Ala Ser Phe
            1025   1030   1035

ttt gac tta ggc gga aat tcc att atc gcc atc aaa atg gta aac atg   3168
Phe Asp Leu Gly Gly Asn Ser Ile Ile Ala Ile Lys Met Val Asn Met
            1040   1045   1050

gcg agg tca gct ggg ata gca ctg aag gta tcc gac ata ttc cag aat   3216
Ala Arg Ser Ala Gly Ile Ala Leu Lys Val Ser Asp Ile Phe Gln Asn
            1055   1060   1065

ccc acg ctc gcc ggc ctt gtg gat gtc atc ggg cga gac ccg gct ccg   3264
Pro Thr Leu Ala Gly Leu Val Asp Val Ile Gly Arg Asp Pro Ala Pro
    1070   1075   1080

tac aac ctc atc cca aca aca gca tac agc gga cct gtt gag cag tcg   3312
Tyr Asn Leu Ile Pro Thr Thr Ala Tyr Ser Gly Pro Val Glu Gln Ser
1085   1090   1095   1100

ttc gcc cag ggc cgt cta tgg ttc ttg gac cag atc gaa ctc gat gcg   3360
Phe Ala Gln Gly Arg Leu Trp Phe Leu Asp Gln Ile Glu Leu Asp Ala
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ttg tgg tac ctt cta cca tac gcc gtt cgc atg cgc ggg cca ttg cat   3408
Leu Trp Tyr Leu Leu Pro Tyr Ala Val Arg Met Arg Gly Pro Leu His
                1120   1125   1130

att gat gcg ctc act att gcg ttg cta gct ata cag caa cga cat gaa   3456
Ile Asp Ala Leu Thr Ile Ala Leu Leu Ala Ile Gln Gln Arg His Glu
                1135   1140   1145

acc ttg cgg aca acc ttt gag gag cag gac ggc gta ggc gtt cag gtt   3504
Thr Leu Arg Thr Thr Phe Glu Glu Gln Asp Gly Val Gly Val Gln Val
                1150   1155   1160

gtc cat gcg agc ccc atc tcc gac ttg agg ata atc gac gta tca ggc   3552
Val His Ala Ser Pro Ile Ser Asp Leu Arg Ile Ile Asp Val Ser Gly
1165   1170   1175   1180

gac cga aac agt gac tac ctc cag ttg cta cac caa gag cag acg act   3600
Asp Arg Asn Ser Asp Tyr Leu Gln Leu Leu His Gln Glu Gln Thr Thr
                1185   1190   1195

cca ttc att cta gca tgt cag gca gga tgg agg gta tca ctg att aga   3648
Pro Phe Ile Leu Ala Cys Gln Ala Gly Trp Arg Val Ser Leu Ile Arg
                1200   1205   1210

cta gga gaa gat gat cac atc ctc tct atc gta atg cat cac atc atc   3696
Leu Gly Glu Asp Asp His Ile Leu Ser Ile Val Met His His Ile Ile
    1215   1220   1225

tcc gac ggc tgg tct atc gac att cta cgc cgg gaa cta agc aat ttc   3744
Ser Asp Gly Trp Ser Ile Asp Ile Leu Arg Arg Glu Leu Ser Asn Phe
    1230   1235   1240

tat tca gcc gct ctc cgg ggc tct gat cct cta tcg gtg gtg agc cca   3792
Tyr Ser Ala Ala Leu Arg Gly Ser Asp Pro Leu Ser Val Val Ser Pro
1245   1250   1255   1260

ctc cca ctc cac tac cgc gac ttt tcc gtt tgg caa aag cag gtc gaa   3840
Leu Pro Leu His Tyr Arg Asp Phe Ser Val Trp Gln Lys Gln Val Glu
                1265   1270   1275

cag gag acc gaa cat gag cgg caa ctc gaa tac tgg gtc aag cag ctc   3888
Gln Glu Thr Glu His Glu Arg Gln Leu Glu Tyr Trp Val Lys Gln Leu
        1280   1285   1290

gca gac agc tcg gcc gcc gaa ttc cta acc gac ttc ccc cga ccc aac   3936
Ala Asp Ser Ser Ala Ala Glu Phe Leu Thr Asp Phe Pro Arg Pro Asn
        1295   1300   1305

ata ctg tcc ggt gaa gca ggt tcc gtg cca gtg acg atc gaa ggc gaa   3984
Ile Leu Ser Gly Glu Ala Gly Ser Val Pro Val Thr Ile Glu Gly Glu
    1310   1315   1320

ctg tat gaa agg ctc caa gaa ttc tgt aaa gta gag caa atg acg cct   4032
Leu Tyr Glu Arg Leu Gln Glu Phe Cys Lys Val Glu Gln Met Thr Pro
1325   1330   1335   1340

ttc gcc gtg ttg tta ggg gcc ttc cgc gcg acc cat tat cgt ctc acc   4080
Phe Ala Val Leu Leu Gly Ala Phe Arg Ala Thr His Tyr Arg Leu Thr
         1345   1350   1355

ggc gcc gaa gac tcg atc atc ggc acg ccc atc gcg aac cgc aac cgc   4128
Gly Ala Glu Asp Ser Ile Ile Gly Thr Pro Ile Ala Asn Arg Asn Arg
         1360   1365   1370

cag gag ctt gaa aac atg atc ggc ttc ttc gtc aac acc caa tgc atg   4176
Gln Glu Leu Glu Asn Met Ile Gly Phe Phe Val Asn Thr Gln Cys Met
         1375   1380   1385

cga atc acg gtc gac ggc gac gac act ttt gaa agc ctg gtg cga caa   4224
Arg Ile Thr Val Asp Gly Asp Asp Thr Phe Glu Ser Leu Val Arg Gln
      1390   1395   1400

gtt cgg acc acg gcg acg gcg gca ttc gag cac caa gac gtc ccc ttt   4272
Val Arg Thr Thr Ala Thr Ala Ala Phe Glu His Gln Asp Val Pro Phe
1405   1410   1415   1420

gag cgc gtc gtg acg gca ctc ctt cca cgc tcg aga gac cta tcc cga   4320
Glu Arg Val Val Thr Ala Leu Leu Pro Arg Ser Arg Asp Leu Ser Arg
         1425   1430   1435

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aac cca cta gca cag ctc acc ttc gct ctt cat tct caa cag gac ctc    4368
Asn Pro Leu Ala Gln Leu Thr Phe Ala Leu His Ser Gln Gln Asp Leu
        1440                1445                1450


ggc aag ttc gag ctg gag ggt ctc gta gcg gaa ccc gtc tcg aac aag    4416
Gly Lys Phe Glu Leu Glu Gly Leu Val Ala Glu Pro Val Ser Asn Lys
        1455                1460                1465


gta tac acc agg ttc gac gtg gag ttt cac ctg ttc caa gaa gcc gga    4464
Val Tyr Thr Arg Phe Asp Val Glu Phe His Leu Phe Gln Glu Ala Gly
        1470                1475                1480


aga cta agc ggt aac gtg gca ttt gcg gca gat cta ttc aag cct gag    4512
Arg Leu Ser Gly Asn Val Ala Phe Ala Ala Asp Leu Phe Lys Pro Glu
    1485                1490                1495                1500


acc att agc aat gta gtc gcc ata ttt ttc caa atc ctg cga caa ggc    4560
Thr Ile Ser Asn Val Val Ala Ile Phe Phe Gln Ile Leu Arg Gln Gly
        1505                1510                1515


att cgc cag cct cgg act cca atc gct gtt ctc ccg ctt acc gat ggg    4608
Ile Arg Gln Pro Arg Thr Pro Ile Ala Val Leu Pro Leu Thr Asp Gly
        1520                1525                1530


tta gcg gac ctt cgt gcc atg ggc ttg ctt gag atc gag aag gca gaa    4656
Leu Ala Asp Leu Arg Ala Met Gly Leu Leu Glu Ile Glu Lys Ala Glu
        1535                1540                1545
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tac ccg cgg gag tcg agc gtc gtc gac gtc ttc cgc aag cag gtg gcc   4704
Tyr Pro Arg Glu Ser Ser Val Val Asp Val Phe Arg Lys Gln Val Ala
    1550   1555   1560

gct cac ccg cac gct ttt gcc gtt gtc gat tcg gca tcg cgc ctc aca   4752
Ala His Pro His Ala Phe Ala Val Val Asp Ser Ala Ser Arg Leu Thr
1565   1570   1575   1580

tat gct gat ctc gat cgt caa tcc gat caa ctc gcg acc tgg ctc ggt   4800
Tyr Ala Asp Leu Asp Arg Gln Ser Asp Gln Leu Ala Thr Trp Leu Gly
        1585   1590   1595

cgg cgc aat atg acg gct gag acg ctg gtc ggg gtg tta gca ccg cgg   4848
Arg Arg Asn Met Thr Ala Glu Thr Leu Val Gly Val Leu Ala Pro Arg
        1600   1605   1610

tca tgt caa aca gtt gtt gcc att tta ggt atc ctg aaa gcg aat ctc   4896
Ser Cys Gln Thr Val Val Ala Ile Leu Gly Ile Leu Lys Ala Asn Leu
        1615   1620   1625

gca tat ctc ccg ctt gat gtg aat tgt cct acc gcc cgc ctg caa aca   4944
Ala Tyr Leu Pro Leu Asp Val Asn Cys Pro Thr Ala Arg Leu Gln Thr
    1630   1635   1640

atc cta tct aca ttg aat cgg cac aag ttg gtc cta ctc ggc tct aac   4992
Ile Leu Ser Thr Leu Asn Arg His Lys Leu Val Leu Leu Gly Ser Asn
1645   1650   1655   1660

gca act act ccg gat gtc cag ata cct gat gta gag ctg gta cga atc   5040
Ala Thr Thr Pro Asp Val Gln Ile Pro Asp Val Glu Leu Val Arg Ile
         1665   1670   1675

agc gat atc tta gat cgc ccc atc aat ggc cag gca aag cta aat ggt   5088
Ser Asp Ile Leu Asp Arg Pro Ile Asn Gly Gln Ala Lys Leu Asn Gly
       1680   1685   1690

cat aca aaa tcg aat ggc tac tca aag cca aac ggc tat acg cat ctg   5136
His Thr Lys Ser Asn Gly Tyr Ser Lys Pro Asn Gly Tyr Thr His Leu
      1695   1700   1705

aaa ggc tat tca aac cta aac ggt tat tca aaa caa aat ggt tat gca   5184
Lys Gly Tyr Ser Asn Leu Asn Gly Tyr Ser Lys Gln Asn Gly Tyr Ala
    1710   1715   1720

caa ctc aac ggc cat aga gag cgt aac aat tat tta gat cta aat ggg   5232
Gln Leu Asn Gly His Arg Glu Arg Asn Asn Tyr Leu Asp Leu Asn Gly
1725   1730   1735   1740

cac tca ctg cta aat ggg aat tca gac atc acc aca tca ggg ccc tca   5280
His Ser Leu Leu Asn Gly Asn Ser Asp Ile Thr Thr Ser Gly Pro Ser
       1745   1750   1755

gca aca agc ctt gcc tac gtg atc ttc aca tcc ggc tca acc gga aag   5328
Ala Thr Ser Leu Ala Tyr Val Ile Phe Thr Ser Gly Ser Thr Gly Lys
       1760   1765   1770

ccc aaa gga gtc atg gtc gaa cac cgc agc atc atc cga ctt gca aag   5376
Pro Lys Gly Val Met Val Glu His Arg Ser Ile Ile Arg Leu Ala Lys
    1775   1780   1785

aag aac aga atc ata tcc agg ttc cca tct gta gcc aag gta gct cac   5424
Lys Asn Arg Ile Ile Ser Arg Phe Pro Ser Val Ala Lys Val Ala His
    1790   1795   1800

ctc tca aac atc gcc ttt gac gcc gcc act tgg gaa atg ttc gca gcc   5472
Leu Ser Asn Ile Ala Phe Asp Ala Ala Thr Trp Glu Met Phe Ala Ala
1805   1810   1815   1820

ctt cta aac ggc gga acg ctg gtc tgt atc gac tat atg acc acc ctg   5520
Leu Leu Asn Gly Gly Thr Leu Val Cys Ile Asp Tyr Met Thr Thr Leu
    1825   1830   1835

gac agc aaa acg ctc gag gcc gcg ttt gca cga gaa caa atc aac gcc   5568
Asp Ser Lys Thr Leu Glu Ala Ala Phe Ala Arg Glu Gln Ile Asn Ala
    1840   1845   1850

gcg tta ctc acg ccc gct ttg ttg aag cag tgc cta gcc aac att ccc   5616
Ala Leu Leu Thr Pro Ala Leu Leu Lys Gln Cys Leu Ala Asn Ile Pro
    1855   1860   1865

act acc cta ggc agg ctg agt gca ctc gtt att gga ggt gat agg ctt   5664
Thr Thr Leu Gly Arg Leu Ser Ala Leu Val Ile Gly Gly Asp Arg Leu
    1870   1875   1880

gac ggc caa gac gcg atc gca gca cat gcg ctt gtc ggt gct ggc gtg 5712
Asp Gly Gln Asp Ala Ile Ala Ala His Ala Leu Val Gly Ala Gly Val
1885   1890   1895   1900

tat aat gcg tat ggc ccg acc gaa aac gga gtg atc agt acg att tat 5760
Tyr Asn Ala Tyr Gly Pro Thr Glu Asn Gly Val Ile Ser Thr Ile Tyr
        1905   1910   1915

aat atc act aaa aac gac tcg ttc atc aac gga gtc ccc atc ggc tgt 5808
Asn Ile Thr Lys Asn Asp Ser Phe Ile Asn Gly Val Pro Ile Gly Cys
        1920   1925   1930

gca atc agc aat tcc ggc gcc tac atc aca gac cca gac cag cag ctc 5856
Ala Ile Ser Asn Ser Gly Ala Tyr Ile Thr Asp Pro Asp Gln Gln Leu
        1935   1940   1945

gta cct cct ggc gtc atg ggt gaa ctc gtc gtt acc ggt gac ggg ctc 5904
Val Pro Pro Gly Val Met Gly Glu Leu Val Val Thr Gly Asp Gly Leu
        1950   1955   1960

gcg cgg ggg tat aca gac cca gca cta gac gcg ggc cgc ttc gtc cag 5952
Ala Arg Gly Tyr Thr Asp Pro Ala Leu Asp Ala Gly Arg Phe Val Gln
1965   1970   1975   1980

atc atg atc aat gac aag gcc gtg agg gcg tac cga acg ggt gac cgg 6000
Ile Met Ile Asn Asp Lys Ala Val Arg Ala Tyr Arg Thr Gly Asp Arg
        1985   1990   1995

gca cga tat cgc gta gga gac ggt cag atc gag ttc ttc gga cgc atg   6048
Ala Arg Tyr Arg Val Gly Asp Gly Gln Ile Glu Phe Phe Gly Arg Met
        2000   2005   2010

gat cag caa gtc aag atc cga ggt cac cgc att gaa cca gcc gaa gtg   6096
Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Pro Ala Glu Val
    2015   2020   2025

gag cgt gct att ctc gac caa gac tcg gcc cgc gac gcc gtc gtt gtc   6144
Glu Arg Ala Ile Leu Asp Gln Asp Ser Ala Arg Asp Ala Val Val Val
    2030   2035   2040

atc cgg cac caa gaa ggt gaa gaa ccg gag atg gtt ggt ttc gtc gcg   6192
Ile Arg His Gln Glu Gly Glu Glu Pro Glu Met Val Gly Phe Val Ala
2045   2050   2055   2060

acc cac ggc gat cac tct gcc gaa caa gag gaa gca gac gac cag gtt   6240
Thr His Gly Asp His Ser Ala Glu Gln Glu Glu Ala Asp Asp Gln Val
        2065   2070   2075

gaa ggt tgg aaa gac ttc ttc gag agc aat aca tat gcc gac atg gat   6288
Glu Gly Trp Lys Asp Phe Phe Glu Ser Asn Thr Tyr Ala Asp Met Asp
        2080   2085   2090

acc atc ggc cag tct gct ata ggc aac gac ttt acg ggc tgg acg tcc   6336
Thr Ile Gly Gln Ser Ala Ile Gly Asn Asp Phe Thr Gly Trp Thr Ser
        2095   2100   2105

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atg tac gac ggg agc gag atc aac aag gcc gag atg cag gag tgg ctc    6384
Met Tyr Asp Gly Ser Glu Ile Asn Lys Ala Glu Met Gln Glu Trp Leu
    2110            2115            2120


gac gac acc atg cgc aca ctc ctc gat ggc caa gcg ccg ggt cac gta    6432
Asp Asp Thr Met Arg Thr Leu Leu Asp Gly Gln Ala Pro Gly His Val
2125            2130            2135            2140


ctc gaa ata ggc aca ggc agt ggc atg gta ttg ttt aac tta ggg gcc    6480
Leu Glu Ile Gly Thr Gly Ser Gly Met Val Leu Phe Asn Leu Gly Ala
            2145            2150            2155


ggg cta caa agc tac gta ggt ctt gaa cca tct aga tct gca gcc acg    6528
Gly Leu Gln Ser Tyr Val Gly Leu Glu Pro Ser Arg Ser Ala Ala Thr
            2160            2165            2170


ttt gtt acc aaa gcg atc aat tcc acc cca gct ctt gca gga aag gcc    6576
Phe Val Thr Lys Ala Ile Asn Ser Thr Pro Ala Leu Ala Gly Lys Ala
            2175            2180            2185


gaa gtg cac gtc ggc aca gcg aca gac ata aac cga ctt cgt gga ctt    6624
Glu Val His Val Gly Thr Ala Thr Asp Ile Asn Arg Leu Arg Gly Leu
    2190            2195            2200


cgt ccc gat cta gtt gtg ctc aac tcg gta gtc cag tat ttc ccc acg    6672
Arg Pro Asp Leu Val Val Leu Asn Ser Val Val Gln Tyr Phe Pro Thr
2205            2210            2215            2220
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ccc gag tac cta cta gag gtc gtg gag agt ctc gtc cgg att ccg ggc   6720
Pro Glu Tyr Leu Leu Glu Val Val Glu Ser Leu Val Arg Ile Pro Gly
         2225   2230   2235

gtc aag cgc gtg gtc ttc ggc gac ata cga tct cac gcc acg aac aga   6768
Val Lys Arg Val Val Phe Gly Asp Ile Arg Ser His Ala Thr Asn Arg
         2240   2245   2250

cat ttt ctt gct gcc agg gcg ctg cat tcg ctg ggc tcc aag gcg acc   6816
His Phe Leu Ala Ala Arg Ala Leu His Ser Leu Gly Ser Lys Ala Thr
         2255   2260   2265

aaa gat gct ata cgt caa aag atg acg gag atg gaa gag cgc gag gaa   6864
Lys Asp Ala Ile Arg Gln Lys Met Thr Glu Met Glu Glu Arg Glu Glu
         2270   2275   2280

gag ctg ctc gtc gac ccg gcc ttc ttc acg gcg ctg ctg cag ggc cag   6912
Glu Leu Leu Val Asp Pro Ala Phe Phe Thr Ala Leu Leu Gln Gly Gln
2285   2290   2295   2300

ctt gcc gat cga atc aag cac gtc gag atc ctc ccg aag aac atg cgc   6960
Leu Ala Asp Arg Ile Lys His Val Glu Ile Leu Pro Lys Asn Met Arg
         2305   2310   2315

gcc acg aac gag ctg agc gcg tac cgg tat aca gcc gtc att cac gta   7008
Ala Thr Asn Glu Leu Ser Ala Tyr Arg Tyr Thr Ala Val Ile His Val
         2320   2325   2330

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cgc ggc cca gag gaa cag tcg cgg ccc gtg tat ccg atc caa gtg aac    7056
Arg Gly Pro Glu Glu Gln Ser Arg Pro Val Tyr Pro Ile Gln Val Asn
        2335                2340                2345


gac tgg atc gac ttt cag gcc tca cgc att gac cgc cgc gcc ctt ctc    7104
Asp Trp Ile Asp Phe Gln Ala Ser Arg Ile Asp Arg Arg Ala Leu Leu
    2350                2355                2360


cga ctc cta cag cgc tcg gca gac gcc gcg acc gtc gcc gtc agc aac    7152
Arg Leu Leu Gln Arg Ser Ala Asp Ala Ala Thr Val Ala Val Ser Asn
2365                2370                2375                2380


atc ccc tac agc aag acg att gta gaa cgc cat gtc gtc gag tcc ctt    7200
Ile Pro Tyr Ser Lys Thr Ile Val Glu Arg His Val Val Glu Ser Leu
            2385                2390                2395


gac aat aac aac agg gag aat acg cat aga gca cca gac ggc gcg gct    7248
Asp Asn Asn Asn Arg Glu Asn Thr His Arg Ala Pro Asp Gly Ala Ala
            2400                2405                2410


tgg atc tcg gcc gtc cgc tcc aag gcc gag cgc tgc acg tcc ctc tcc    7296
Trp Ile Ser Ala Val Arg Ser Lys Ala Glu Arg Cys Thr Ser Leu Ser
        2415                2420                2425


gtg acc gat ctt gtg cag ctc ggg gaa gaa gcc ggc ttt cgc gta gaa    7344
Val Thr Asp Leu Val Gln Leu Gly Glu Glu Ala Gly Phe Arg Val Glu
        2430                2435                2440
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gtc agc gca gcg cgg cag tgg tct caa agc ggc gcg ctc gat gcc gtc   7392
Val Ser Ala Ala Arg Gln Trp Ser Gln Ser Gly Ala Leu Asp Ala Val
2445   2450   2455   2460

ttt cac cgc tat aat ttg ccc act caa agc aat agt cgc gtt ctg att   7440
Phe His Arg Tyr Asn Leu Pro Thr Gln Ser Asn Ser Arg Val Leu Ile
          2465   2470   2475

cag ttc cct acc gaa gat ggc cag acg cga aga tcc gcc act ctg aca   7488
Gln Phe Pro Thr Glu Asp Gly Gln Thr Arg Arg Ser Ala Thr Leu Thr
          2480   2485   2490

aac cga cca cta cag cgt ctg cag agc cgt cgg ttc gca tca cag atc   7536
Asn Arg Pro Leu Gln Arg Leu Gln Ser Arg Arg Phe Ala Ser Gln Ile
          2495   2500   .   2505

cgc gaa cag ctg aag gcc gtg ctc ccg tca tac atg atc ccc tcc cgc   7584
Arg Glu Gln Leu Lys Ala Val Leu Pro Ser Tyr Met Ile Pro Ser Arg
          2510   2515   2520

atc gtg gtc ata gac cag atg cct ctc aat gcc aat ggc aag gtc gac   7632
Ile Val Val Ile Asp Gln Met Pro Leu Asn Ala Asn Gly Lys Val Asp
2525   2530   2535   2540

cgg aaa gaa ctt acc aga agg gcc caa atc gcg ccg aaa tct cag gcg   7680
Arg Lys Glu Leu Thr Arg Arg Ala Gln Ile Ala Pro Lys Ser Gln Ala
          2545   2550   2555

gct ccc gcc aaa ccc gtc aaa cag gtc gat ccg ttc gtc aac ctg gaa   7728
Ala Pro Ala Lys Pro Val Lys Gln Val Asp Pro Phe Val Asn Leu Glu
          2560   2565   2570

gcc att tta tgt gag gag ttc gcg gag gtg ctg ggc atg gaa gtc ggc   7776
Ala Ile Leu Cys Glu Glu Phe Ala Glu Val Leu Gly Met Glu Val Gly
      2575   2580   2585

gtg aac gac cac ttc ttc caa cta ggc gga cac tct ctc ttg gcc acg   7824
Val Asn Asp His Phe Phe Gln Leu Gly Gly His Ser Leu Leu Ala Thr
      2590   2595   2600

aag ctc gtc gcg cgt ctc agt cgt cgg cta aac ggt cgt gtg tct gtg   7872
Lys Leu Val Ala Arg Leu Ser Arg Arg Leu Asn Gly Arg Val Ser Val
2605   2610   2615   2620

agg gat gtg ttc gac cag cct gtg att tcc gac ctc gca gtc acc ctc   7920
Arg Asp Val Phe Asp Gln Pro Val Ile Ser Asp Leu Ala Val Thr Leu
              2625   2630   2635

cgc cag gga ctg acc ttg gaa aac gcc att ccc gca acg ccg gac agc   7968
Arg Gln Gly Leu Thr Leu Glu Asn Ala Ile Pro Ala Thr Pro Asp Ser
          2640   2645   2650

ggg tat tgg gag cag aca atg tcc gca ccg aca acc ccg agc gac gac   8016
Gly Tyr Trp Glu Gln Thr Met Ser Ala Pro Thr Thr Pro Ser Asp Asp
      2655   2660   2665

atg gag gcc gtg cta tgc aag gag ttt gcg gat gtg ctt ggc gtc gaa   8064
Met Glu Ala Val Leu Cys Lys Glu Phe Ala Asp Val Leu Gly Val Glu
   2670   2675   2680

gtc agc gcc acc gac agc ttc ttc gat ctc ggt ggg cat tcc ctc atg   8112
Val Ser Ala Thr Asp Ser Phe Phe Asp Leu Gly Gly His Ser Leu Met
2685   2690   2695   2700

gct acg aag ctc gct gcg cgt att agc cgt cgg cta gat gta ccg gtg   8160
Ala Thr Lys Leu Ala Ala Arg Ile Ser Arg Arg Leu Asp Val Pro Val
          2705   2710   2715

tca atc aaa gac ata ttc gat cac tca gtt cct cta aac ctt gcg agg   8208
Ser Ile Lys Asp Ile Phe Asp His Ser Val Pro Leu Asn Leu Ala Arg
          2720   2725   2730

aag att cgg ctc act caa gca aaa ggc cac gaa gcg acc aat gga gta   8256
Lys Ile Arg Leu Thr Gln Ala Lys Gly His Glu Ala Thr Asn Gly Val
          2735   2740   2745

caa atc gcc aac gac gcc cca ttc caa ctc att tcc gta gaa gat cca   8304
Gln Ile Ala Asn Asp Ala Pro Phe Gln Leu Ile Ser Val Glu Asp Pro
   2750   2755   2760

gag ata ttc gtc caa cgt gaa atc gcc cct caa cta caa tgc tca ccc   8352
Glu Ile Phe Val Gln Arg Glu Ile Ala Pro Gln Leu Gln Cys Ser Pro
2765   2770   2775   2780

gag aca atc cta gac gtc tac ccc gcc acg caa atg caa agg gtc ttc   8400
Glu Thr Ile Leu Asp Val Tyr Pro Ala Thr Gln Met Gln Arg Val Phe
        2785   2790   2795

ctc ctc aac cca gta aca gga aag ccg cgc tca cca acg cca ttt cac   8448
Leu Leu Asn Pro Val Thr Gly Lys Pro Arg Ser Pro Thr Pro Phe His
        2800   2805   2810

ata gac ttc ccg ccg gac gca gac tgc gcc agc ctg atg cgg gca tgt   8496
Ile Asp Phe Pro Pro Asp Ala Asp Cys Ala Ser Leu Met Arg Ala Cys
        2815   2820   2825

gca tct cta gcg aag cat ttc gat atc ttc agg acg gtg ttc ctc gaa   8544
Ala Ser Leu Ala Lys His Phe Asp Ile Phe Arg Thr Val Phe Leu Glu
        2830   2835   2840

gcc aga ggc gaa ctc tac caa gta gtt cta aaa cac gtc gac gtg ccc   8592
Ala Arg Gly Glu Leu Tyr Gln Val Val Leu Lys His Val Asp Val Pro
2845   2850   2855   2860

atc gag atg ctc cag acc gaa gaa aac atc aac agc gcg acc cgg tcg   8640
Ile Glu Met Leu Gln Thr Glu Glu Asn Ile Asn Ser Ala Thr Arg Ser
        2865   2870   2875

ttc ctg gac gta gac gca gaa aaa ccc atc cgg cta ggc cag cca ctg   8688
Phe Leu Asp Val Asp Ala Glu Lys Pro Ile Arg Leu Gly Gln Pro Leu
        2880   2885   2890

atc cgc atc gcg ata cta gag aag ccc ggg tcc acg ctg cgc gtc atc   8736
Ile Arg Ile Ala Ile Leu Glu Lys Pro Gly Ser Thr Leu Arg Val Ile
    2895   2900   2905

cta cga tta tcc cac gcc tta tac gac ggc ctg agc cta gag cac atc   8784
Leu Arg Leu Ser His Ala Leu Tyr Asp Gly Leu Ser Leu Glu His Ile
    2910   2915   2920

ctg cac tct ctg cac atc ctc ttt ttc ggc ggc agt ctt ccc ccg ccg   8832
Leu His Ser Leu His Ile Leu Phe Phe Gly Gly Ser Leu Pro Pro Pro
2925   2930   2935   2940

ccc aag ttc gcc ggg tac atg caa cac gtc gcg agc agt cgc aga gaa   8880
Pro Lys Phe Ala Gly Tyr Met Gln His Val Ala Ser Ser Arg Arg Glu
    2945   2950   2955

ggc tac gat ttc tgg cgt tcc gtt ctc cga gat tcg tct atg aca gtc   8928
Gly Tyr Asp Phe Trp Arg Ser Val Leu Arg Asp Ser Ser Met Thr Val
    2960   2965   2970

atc aaa ggc aac aat aat aca act cca cca cct cct cct caa caa caa   8976
Ile Lys Gly Asn Asn Asn Thr Thr Pro Pro Pro Pro Pro Gln Gln Gln
    2975   2980   2985

tcc acc ccc tcc gga gcc cac cac gcc tcc aaa gta gtc act atc cca   9024
Ser Thr Pro Ser Gly Ala His His Ala Ser Lys Val Val Thr Ile Pro
    2990   2995   3000

acc caa gcc aac aca gac agc cgg atc acg cgc gcc acg atc ttc act   9072
Thr Gln Ala Asn Thr Asp Ser Arg Ile Thr Arg Ala Thr Ile Phe Thr
3005   3010   3015   3020

acc gct tgc gca cta atg ctc gcg aaa gaa gac aac tcc agc gac gtc   9120
Thr Ala Cys Ala Leu Met Leu Ala Lys Glu Asp Asn Ser Ser Asp Val
       3025   3030   3035

gtc ttc ggg cgt acg gta tcg ggg cgt caa ggc ctg ccc cta gcc cac   9168
Val Phe Gly Arg Thr Val Ser Gly Arg Gln Gly Leu Pro Leu Ala His
       3040   3045   3050

caa aac gtg atc gga cca tgt ctc aac caa gtg ccc gtg cgc gcg cgc   9216
Gln Asn Val Ile Gly Pro Cys Leu Asn Gln Val Pro Val Arg Ala Arg
       3055   3060   3065

ggt tta aac cga gga acc act cac cac cga gaa ctt ctc cgc gag atg   9264
Gly Leu Asn Arg Gly Thr Thr His His Arg Glu Leu Leu Arg Glu Met
   3070   3075   3080

caa gag caa tat ctc aac agt ctc gct ttc gaa act ctc ggg tac gac   9312
Gln Glu Gln Tyr Leu Asn Ser Leu Ala Phe Glu Thr Leu Gly Tyr Asp
3085   3090   3095   3100

gag atc aag gcg cac tgc aca gac tgg ccg gac gtg cca gcg acc gcg   9360
Glu Ile Lys Ala His Cys Thr Asp Trp Pro Asp Val Pro Ala Thr Ala
       3105   3110   3115

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agc ttc ggg tgc tgc atc gtg tac cag aac ttc gat tcg cac ccg gac    9408
Ser Phe Gly Cys Cys Ile Val Tyr Gln Asn Phe Asp Ser His Pro Asp
        3120            3125            3130


agc cga gtc gaa gag cag cgg ctg cag atc ggg gtc ttg tcg cgg aac    9456
Ser Arg Val Glu Glu Gln Arg Leu Gln Ile Gly Val Leu Ser Arg Asn
    3135            3140            3145


tac gag gct att aat gag ggg ctc gtg cat gat ctt gtt att gct ggg    9504
Tyr Glu Ala Ile Asn Glu Gly Leu Val His Asp Leu Val Ile Ala Gly
    3150            3155            3160


gag tcg gag cct gat ggg gat gat ttg agg gtt act gtt gtg gcg aat    9552
Glu Ser Glu Pro Asp Gly Asp Asp Leu Arg Val Thr Val Val Ala Asn
3165            3170            3175            3180


cgg agg ttg tgc gat gag gaa agg ttg aag agg atg ctg gag gag ctg    9600
Arg Arg Leu Cys Asp Glu Glu Arg Leu Lys Arg Met Leu Glu Glu Leu
        3185            3190            3195


tgt ggg aat att cgg gct ttg gcg ttg gtt tag                        9633
Cys Gly Asn Ile Arg Ala Leu Ala Leu Val
        3200            3205
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<210> 2

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<400> 2

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1   5   10   15

Leu Ser Leu Ser Cys Pro Leu Leu Pro His Asp Asp Glu Lys His Ser
            20   25   30

Asp Asn Leu Tyr Glu Gln Ala Thr Arg His Phe Gly Leu Ser Arg Asp
            35   40   45

Lys Ile Glu Asn Val Leu Pro Cys Thr Ser Phe Gln Cys Asp Val Ile
        50   55   60

Asp Cys Ala Val Asp Asp Arg Arg His Ala Ile Gly His Val Val Tyr
65   70   75   80

Asp Ile Pro Asn Thr Val Asp Ile Gln Arg Leu Ala Ala Ala Trp Lys
                85   90   95

Glu Val Val Arg Gln Thr Pro Ile Leu Arg Thr Gly Ile Phe Thr Ser
                100   105   110

Glu Thr Gly Asp Ser Phe Gln Ile Val Leu Lys Glu Gly Cys Leu Pro
            115   120   125

Trp Met Tyr Ala Thr Cys Leu Gly Met Lys Gly Ala Val Ile Gln Asp
        130   135   140

Glu Ala Val Ala Ala Met Thr Gly Pro Arg Cys Asn Arg Tyr Val Val
145   150   155   160

Leu Glu Asp Pro Ser Thr Lys Gln Arg Leu Leu Ile Trp Thr Phe Ser
            165   170   175

His Ala Leu Val Asp Tyr Thr Val Gln Glu Arg Ile Leu Gln Arg Val
            180   185   190

Leu Thr Val Tyr Asp Gly Arg Asp Val Glu Cys Pro Arg Ile Lys Asp
        195   200   205

Thr Glu His Val Ser Arg Phe Trp Gln Gln His Phe Glu Gly Leu Asp
        210   215   220

Ala Ser Val Phe Pro Leu Leu Pro Ser His Leu Thr Val Cys Asn Pro
225   230   235   240

Asn Ala Arg Ala Glu His His Ile Ser Tyr Thr Gly Pro Val Gln Arg
            245   250   255

Lys Trp Ser His Thr Ser Ile Cys Arg Ala Ala Leu Ala Val Leu Leu
            260   265   270

Ser Arg Phe Thr His Ser Ser Glu Ala Leu Phe Gly Val Val Thr Glu
        275   280   285

Gln Ser His Asn Ser Glu Asp Gln Arg Arg Ser Ile Asp Gly Pro Ala
290   295   300

Arg Thr Val Val Pro Ile Arg Val Leu Cys Ala Pro Asp Gln Tyr Val
305   310   315   320

Ser Asp Val Ile Gly Ala Ile Thr Ala His Glu His Ala Met Arg Gly
          325   330   335

Phe Glu His Ala Gly Leu Arg Asn Ile Arg Arg Thr Gly Asp Asp Gly
          340   345   350

Ser Ala Ala Cys Gly Phe Gln Thr Val Leu Leu Val Thr Asp Gly Asp
          355   360   365

Ala Pro Lys Thr Pro Gly Ser Val Leu His Arg Ser Val Glu Glu Ser
          370   375   380

Asp Arg Phe Met Pro Cys Ala Asn Arg Ala Leu Leu Leu Asp Cys Gln
385   390   395   400

Met Ala Gly Asn Ser Ala Ser Leu Val Ala Arg Tyr Asp His Asn Val
          405   410   415

Ile Asp Pro Arg Gln Met Ser Arg Phe Leu Arg Gln Leu Gly Tyr Leu
          420   425   430

Ile Gln Gln Phe His His His Val Asp Leu Pro Leu Val Lys Glu Leu
          435   440   445

Asp Val Val Thr Ala Glu Asp Cys Ala Glu Ile Glu Lys Trp Asn Ser
    450   455   460

Glu Arg Leu Thr Met Gln Asp Ala Leu Ile His Asp Thr Ile Ser Lys
465   470   475   480

Trp Ala Ala Gly Asp Pro Asn Lys Ala Ala Val Phe Ala Trp Asp Gly
         485   490   495

Glu Trp Thr Tyr Ala Glu Leu Asp Asn Ile Ser Ser Arg Leu Ala Val
       500   505   510

Tyr Ile Gln Ser Leu Asp Leu Arg Pro Gly Gln Ala Ile Leu Pro Leu
      515   520   525

Cys Phe Glu Lys Ser Lys Trp Val Val Ala Thr Ile Leu Ala Val Leu
    530   535   540

Lys Val Gly Arg Ala Phe Thr Leu Ile Asp Pro Cys Asp Pro Ser Ala
545   550   555   560

Arg Met Ala Gln Val Cys Gln Gln Thr Ser Ala Thr Val Ala Leu Thr
         565   570   575

Ser Lys Leu His Asn Thr Thr Leu Arg Ser Val Val Ser Arg Cys Ile
       580   585   590

Val Val Asp Asp Asp Leu Leu Arg Ser Leu Pro His Ala Asp Gly Arg
    595   600   605

Leu Lys Ala Thr Val Lys Pro Gln Asp Leu Ala Tyr Val Ile Phe Thr
    610   615   620

Ser Gly Ser Thr Gly Glu Pro Lys Gly Ile Met Ile Glu His Arg Gly
625   630   635   640

Phe Val Ser Cys Ala Met Lys Phe Gly Pro Ala Leu Gly Met Asp Glu
          645   650   655

His Thr Arg Ala Leu Gln Phe Ala Ser Tyr Ala Phe Gly Ala Cys Leu
          660   665   670

Val Glu Val Val Thr Ala Leu Met His Gly Gly Cys Val Cys Ile Pro
          675   680   685

Ser Asp Asp Asp Arg Leu Asn Asn Val Pro Glu Phe Ile Lys Arg Ala
          690   695   700

Gln Val Asn Trp Val Ile Leu Thr Pro Ser Tyr Ile Gly Thr Phe Gln
705   710   715   720

Pro Glu Asp Val Pro Gly Leu Gln Thr Leu Val Leu Val Gly Glu Pro
          725   730   735

Ile Ser Ala Ser Ile Arg Asp Thr Trp Ala Ser Gln Val Arg Leu Leu
          740   745   750

Asn Ala Tyr Gly Gln Ser Glu Ser Ser Thr Met Cys Ser Val Thr Glu
        755   760   765

Val Ser Pro Leu Ser Leu Glu Pro Asn Asn Ile Gly Arg Ala Val Gly
        770   775   780

Ala Arg Ser Trp Ile Ile Asp Pro Asp Glu Pro Asp Arg Leu Ala Pro
785   790   795   800

Ile Gly Cys Ile Gly Glu Leu Val Ile Glu Ser Pro Gly Ile Ala Arg
        805   810   815

Asp Tyr Ile Ile Ala Pro Pro Pro Asp Lys Ser Pro Phe Leu Leu Ala
        820   825   830

Pro Pro Ala Trp Tyr Pro Ala Gly Lys Leu Ser Asn Ala Phe Lys Phe
        835   840   845

Tyr Lys Thr Gly Asp Leu Val Arg Tyr Gly Pro Asp Gly Thr Ile Val
        850   855   860

Cys Leu Gly Arg Lys Asp Ser Gln Val Lys Ile Arg Gly Gln Arg Val
865   870   875   880

Glu Ile Ser Ala Val Glu Ala Ser Leu Arg Arg Gln Leu Pro Ser Asp
        885   890   895

Ile Met Pro Val Ala Glu Ala Ile Lys Arg Ser Asp Ser Ser Gly Ser
        900   905   910

Thr Val Leu Thr Ala Phe Leu Ile Gly Ser Ser Lys Ser Gly Asp Gly
　　　915　　　　　　920　　　　　925

Asn Gly His Ala Leu Ser Ala Ala Asp Ala Val Ile Leu Asp His Gly
　　　930　　　　935　　　　　940

Ala Thr Asn Glu Ile Asn Ala Lys Leu Gln Gln Ile Leu Pro Gln His
945　　　　　950　　　　　955　　　　　　960

Ser Val Pro Ser Tyr Tyr Ile His Met Glu Asn Leu Pro Arg Thr Ala
　　　　　965　　　　　970　　　　　975

Thr Gly Lys Ala Asp Arg Lys Met Leu Arg Ser Ile Ala Ser Lys Leu
　　　980　　　　　985　　　　　990

Leu Gly Glu Leu Ser Gln Asn Val Thr Ser Gln Pro Ile Glu Lys His
　　　995　　　　　1000　　　　　1005

Asp Ala Pro Ala Thr Gly Ile Glu Val Lys Leu Lys Glu Leu Trp Phe
　1010　　　　　1015　　　　　1020

Leu Ser Leu Asn Leu Asn Pro Asn Ser Gln Asp Val Gly Ala Ser Phe
025　　　　　1030　　　　　1035　　　　　1040

Phe Asp Leu Gly Gly Asn Ser Ile Ile Ala Ile Lys Met Val Asn Met
　　　1045　　　　　1050　　　　　1055

Ala Arg Ser Ala Gly Ile Ala Leu Lys Val Ser Asp Ile Phe Gln Asn
　　　1060　　　　　1065　　　　　1070

Pro Thr Leu Ala Gly Leu Val Asp Val Ile Gly Arg Asp Pro Ala Pro
    1075   1080   1085

Tyr Asn Leu Ile Pro Thr Thr Ala Tyr Ser Gly Pro Val Glu Gln Ser
    1090   1095   1100

Phe Ala Gln Gly Arg Leu Trp Phe Leu Asp Gln Ile Glu Leu Asp Ala
105   1110   1115   1120

Leu Trp Tyr Leu Leu Pro Tyr Ala Val Arg Met Arg Gly Pro Leu His
      1125   1130   1135

Ile Asp Ala Leu Thr Ile Ala Leu Leu Ala Ile Gln Gln Arg His Glu
     1140   1145   1150

Thr Leu Arg Thr Thr Phe Glu Glu Gln Asp Gly Val Gly Val Gln Val
     1155   1160   1165

Val His Ala Ser Pro Ile Ser Asp Leu Arg Ile Ile Asp Val Ser Gly
    1170   1175   1180

Asp Arg Asn Ser Asp Tyr Leu Gln Leu Leu His Gln Glu Gln Thr Thr
185   1190   1195   1200

Pro Phe Ile Leu Ala Cys Gln Ala Gly Trp Arg Val Ser Leu Ile Arg
     1205   1210   1215

Leu Gly Glu Asp Asp His Ile Leu Ser Ile Val Met His His Ile Ile
        1220   1225   1230

Ser Asp Gly Trp Ser Ile Asp Ile Leu Arg Arg Glu Leu Ser Asn Phe
     1235   1240   1245

Tyr Ser Ala Ala Leu Arg Gly Ser Asp Pro Leu Ser Val Val Ser Pro
    1250   1255   1260

Leu Pro Leu His Tyr Arg Asp Phe Ser Val Trp Gln Lys Gln Val Glu
265   1270   1275   1280

Gln Glu Thr Glu His Glu Arg Gln Leu Glu Tyr Trp Val Lys Gln Leu
       1285   1290   1295

Ala Asp Ser Ser Ala Ala Glu Phe Leu Thr Asp Phe Pro Arg Pro Asn
      1300   1305   1310

Ile Leu Ser Gly Glu Ala Gly Ser Val Pro Val Thr Ile Glu Gly Glu
     1315   1320   1325

Leu Tyr Glu Arg Leu Gln Glu Phe Cys Lys Val Glu Gln Met Thr Pro
    1330   1335   1340

Phe Ala Val Leu Leu Gly Ala Phe Arg Ala Thr His Tyr Arg Leu Thr
345   1350   1355   1360

Gly Ala Glu Asp Ser Ile Ile Gly Thr Pro Ile Ala Asn Arg Asn Arg
      1365   1370   1375

Gln Glu Leu Glu Asn Met Ile Gly Phe Phe Val Asn Thr Gln Cys Met
　　　　　1380　　　　　　　　　　1385　　　　　　　　1390

Arg Ile Thr Val Asp Gly Asp Asp Thr Phe Glu Ser Leu Val Arg Gln
　　　　1395　　　　　　　　1400　　　　　　　1405

Val Arg Thr Thr Ala Thr Ala Ala Phe Glu His Gln Asp Val Pro Phe
　　　1410　　　　　　　1415　　　　　　　　1420

Glu Arg Val Val Thr Ala Leu Leu Pro Arg Ser Arg Asp Leu Ser Arg
425　　　　　　　　1430　　　　　　1435　　　　　　　　1440

Asn Pro Leu Ala Gln Leu Thr Phe Ala Leu His Ser Gln Gln Asp Leu
　　　　　　1445　　　　　　　1450　　　　　　　1455

Gly Lys Phe Glu Leu Glu Gly Leu Val Ala Glu Pro Val Ser Asn Lys
　　　　　1460　　　　　　1465　　　　　　　　1470

Val Tyr Thr Arg Phe Asp Val Glu Phe His Leu Phe Gln Glu Ala Gly
　　　1475　　　　　　　1480　　　　　　　1485

Arg Leu Ser Gly Asn Val Ala Phe Ala Ala Asp Leu Phe Lys Pro Glu
　　　1490　　　　　　1495　　　　　　　1500

Thr Ile Ser Asn Val Val Ala Ile Phe Phe Gln Ile Leu Arg Gln Gly
505　　　　　　1510　　　　　　　1515　　　　　　　1520

Ile Arg Gln Pro Arg Thr Pro Ile Ala Val Leu Pro Leu Thr Asp Gly
          1525   1530   1535

Leu Ala Asp Leu Arg Ala Met Gly Leu Leu Glu Ile Glu Lys Ala Glu
          1540   1545   1550

Tyr Pro Arg Glu Ser Ser Val Val Asp Val Phe Arg Lys Gln Val Ala
          1555   1560   1565

Ala His Pro His Ala Phe Ala Val Val Asp Ser Ala Ser Arg Leu Thr
      1570   1575   1580

Tyr Ala Asp Leu Asp Arg Gln Ser Asp Gln Leu Ala Thr Trp Leu Gly
585   1590   1595   1600

Arg Arg Asn Met Thr Ala Glu Thr Leu Val Gly Val Leu Ala Pro Arg
          1605   1610   1615

Ser Cys Gln Thr Val Val Ala Ile Leu Gly Ile Leu Lys Ala Asn Leu
          1620   1625   1630

Ala Tyr Leu Pro Leu Asp Val Asn Cys Pro Thr Ala Arg Leu Gln Thr
          1635   1640   1645

Ile Leu Ser Thr Leu Asn Arg His Lys Leu Val Leu Leu Gly Ser Asn
      1650   1655   1660

Ala Thr Thr Pro Asp Val Gln Ile Pro Asp Val Glu Leu Val Arg Ile
665   1670   1675   1680

Ser Asp Ile Leu Asp Arg Pro Ile Asn Gly Gln Ala Lys Leu Asn Gly
       1685   1690   1695

His Thr Lys Ser Asn Gly Tyr Ser Lys Pro Asn Gly Tyr Thr His Leu
       1700   1705   1710

Lys Gly Tyr Ser Asn Leu Asn Gly Tyr Ser Lys Gln Asn Gly Tyr Ala
       1715   1720   1725

Gln Leu Asn Gly His Arg Glu Arg Asn Asn Tyr Leu Asp Leu Asn Gly
       1730   1735   1740

His Ser Leu Leu Asn Gly Asn Ser Asp Ile Thr Thr Ser Gly Pro Ser
745   1750   1755   1760

Ala Thr Ser Leu Ala Tyr Val Ile Phe Thr Ser Gly Ser Thr Gly Lys
       1765   1770   1775

Pro Lys Gly Val Met Val Glu His Arg Ser Ile Ile Arg Leu Ala Lys
       1780   1785   1790

Lys Asn Arg Ile Ile Ser Arg Phe Pro Ser Val Ala Lys Val Ala His
       1795   1800   1805

Leu Ser Asn Ile Ala Phe Asp Ala Ala Thr Trp Glu Met Phe Ala Ala
       1810   1815   1820

Leu Leu Asn Gly Gly Thr Leu Val Cys Ile Asp Tyr Met Thr Thr Leu
825   1830   1835   1840

Asp Ser Lys Thr Leu Glu Ala Ala Phe Ala Arg Glu Gln Ile Asn Ala
          1845   1850   1855

Ala Leu Leu Thr Pro Ala Leu Leu Lys Gln Cys Leu Ala Asn Ile Pro
          1860   1865   1870

Thr Thr Leu Gly Arg Leu Ser Ala Leu Val Ile Gly Gly Asp Arg Leu
          1875   1880   1885

Asp Gly Gln Asp Ala Ile Ala Ala His Ala Leu Val Gly Ala Gly Val
          1890   1895   1900

Tyr Asn Ala Tyr Gly Pro Thr Glu Asn Gly Val Ile Ser Thr Ile Tyr
905   1910   1915   1920

Asn Ile Thr Lys Asn Asp Ser Phe Ile Asn Gly Val Pro Ile Gly Cys
          1925   1930   1935

Ala Ile Ser Asn Ser Gly Ala Tyr Ile Thr Asp Pro Asp Gln Gln Leu
          1940   1945   1950

Val Pro Pro Gly Val Met Gly Glu Leu Val Val Thr Gly Asp Gly Leu
          1955   1960   1965

Ala Arg Gly Tyr Thr Asp Pro Ala Leu Asp Ala Gly Arg Phe Val Gln
          1970   1975   1980

Ile Met Ile Asn Asp Lys Ala Val Arg Ala Tyr Arg Thr Gly Asp Arg
985   1990   1995   2000

Ala Arg Tyr Arg Val Gly Asp Gly Gln Ile Glu Phe Phe Gly Arg Met
               2005   2010   2015

Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Pro Ala Glu Val
         2020   2025   2030

Glu Arg Ala Ile Leu Asp Gln Asp Ser Ala Arg Asp Ala Val Val Val
        2035   2040   2045

Ile Arg His Gln Glu Gly Glu Glu Pro Glu Met Val Gly Phe Val Ala
  2050   2055   2060

Thr His Gly Asp His Ser Ala Glu Gln Glu Glu Ala Asp Asp Gln Val
065   2070   2075   2080

Glu Gly Trp Lys Asp Phe Phe Glu Ser Asn Thr Tyr Ala Asp Met Asp
            2085   2090   2095

Thr Ile Gly Gln Ser Ala Ile Gly Asn Asp Phe Thr Gly Trp Thr Ser
        2100   2105   2110

Met Tyr Asp Gly Ser Glu Ile Asn Lys Ala Glu Met Gln Glu Trp Leu
        2115   2120   2125

Asp Asp Thr Met Arg Thr Leu Leu Asp Gly Gln Ala Pro Gly His Val
  2130   2135   2140

Leu Glu Ile Gly Thr Gly Ser Gly Met Val Leu Phe Asn Leu Gly Ala
145   2150   2155   2160

Gly Leu Gln Ser Tyr Val Gly Leu Glu Pro Ser Arg Ser Ala Ala Thr
           2165   2170   2175

Phe Val Thr Lys Ala Ile Asn Ser Thr Pro Ala Leu Ala Gly Lys Ala
           2180   2185   2190

Glu Val His Val Gly Thr Ala Thr Asp Ile Asn Arg Leu Arg Gly Leu
           2195   2200   2205

Arg Pro Asp Leu Val Val Leu Asn Ser Val Val Gln Tyr Phe Pro Thr
  2210   2215   2220

Pro Glu Tyr Leu Leu Glu Val Val Glu Ser Leu Val Arg Ile Pro Gly
225   2230   2235   2240

Val Lys Arg Val Val Phe Gly Asp Ile Arg Ser His Ala Thr Asn Arg
           2245   2250   2255

His Phe Leu Ala Ala Arg Ala Leu His Ser Leu Gly Ser Lys Ala Thr
           2260   2265   2270

Lys Asp Ala Ile Arg Gln Lys Met Thr Glu Met Glu Glu Arg Glu Glu
           2275   2280   2285

Glu Leu Leu Val Asp Pro Ala Phe Phe Thr Ala Leu Leu Gln Gly Gln
   2290   2295   2300

Leu Ala Asp Arg Ile Lys His Val Glu Ile Leu Pro Lys Asn Met Arg
305   2310   2315   2320

Ala Thr Asn Glu Leu Ser Ala Tyr Arg Tyr Thr Ala Val Ile His Val
         2325   2330   2335

Arg Gly Pro Glu Glu Gln Ser Arg Pro Val Tyr Pro Ile Gln Val Asn
         2340   2345   2350

Asp Trp Ile Asp Phe Gln Ala Ser Arg Ile Asp Arg Arg Ala Leu Leu
         2355   2360   2365

Arg Leu Leu Gln Arg Ser Ala Asp Ala Ala Thr Val Ala Val Ser Asn
   2370   2375   2380

Ile Pro Tyr Ser Lys Thr Ile Val Glu Arg His Val Val Glu Ser Leu
385   2390   2395   2400

Asp Asn Asn Asn Arg Glu Asn Thr His Arg Ala Pro Asp Gly Ala Ala
         2405   2410   2415

Trp Ile Ser Ala Val Arg Ser Lys Ala Glu Arg Cys Thr Ser Leu Ser
         2420   2425   2430

Val Thr Asp Leu Val Gln Leu Gly Glu Glu Ala Gly Phe Arg Val Glu
      2435   2440   2445

Val Ser Ala Ala Arg Gln Trp Ser Gln Ser Gly Ala Leu Asp Ala Val
      2450   2455   2460

Phe His Arg Tyr Asn Leu Pro Thr Gln Ser Asn Ser Arg Val Leu Ile
465   2470   2475   2480

Gln Phe Pro Thr Glu Asp Gly Gln Thr Arg Arg Ser Ala Thr Leu Thr
        2485   2490   2495

Asn Arg Pro Leu Gln Arg Leu Gln Ser Arg Arg Phe Ala Ser Gln Ile
        2500   2505   2510

Arg Glu Gln Leu Lys Ala Val Leu Pro Ser Tyr Met Ile Pro Ser Arg
      2515   2520   2525

Ile Val Val Ile Asp Gln Met Pro Leu Asn Ala Asn Gly Lys Val Asp
      2530   2535   2540

Arg Lys Glu Leu Thr Arg Arg Ala Gln Ile Ala Pro Lys Ser Gln Ala
545   2550   2555   2560

Ala Pro Ala Lys Pro Val Lys Gln Val Asp Pro Phe Val Asn Leu Glu
        2565   2570   2575

Ala Ile Leu Cys Glu Glu Phe Ala Glu Val Leu Gly Met Glu Val Gly
        2580   2585   2590

Val Asn Asp His Phe Phe Gln Leu Gly Gly His Ser Leu Leu Ala Thr
    2595   2600   2605

Lys Leu Val Ala Arg Leu Ser Arg Arg Leu Asn Gly Arg Val Ser Val
  2610   2615   2620

Arg Asp Val Phe Asp Gln Pro Val Ile Ser Asp Leu Ala Val Thr Leu
625   2630   2635   2640

Arg Gln Gly Leu Thr Leu Glu Asn Ala Ile Pro Ala Thr Pro Asp Ser
     2645   2650   2655

Gly Tyr Trp Glu Gln Thr Met Ser Ala Pro Thr Thr Pro Ser Asp Asp
    2660   2665   2670

Met Glu Ala Val Leu Cys Lys Glu Phe Ala Asp Val Leu Gly Val Glu
   2675   2680   2685

Val Ser Ala Thr Asp Ser Phe Phe Asp Leu Gly Gly His Ser Leu Met
  2690   2695   2700

Ala Thr Lys Leu Ala Ala Arg Ile Ser Arg Arg Leu Asp Val Pro Val
705   2710   2715   2720

Ser Ile Lys Asp Ile Phe Asp His Ser Val Pro Leu Asn Leu Ala Arg
    2725   2730   2735

Lys Ile Arg Leu Thr Gln Ala Lys Gly His Glu Ala Thr Asn Gly Val
         2740   2745   2750

Gln Ile Ala Asn Asp Ala Pro Phe Gln Leu Ile Ser Val Glu Asp Pro
     2755   2760   2765

Glu Ile Phe Val Gln Arg Glu Ile Ala Pro Gln Leu Gln Cys Ser Pro
   2770   2775   2780

Glu Thr Ile Leu Asp Val Tyr Pro Ala Thr Gln Met Gln Arg Val Phe
785   2790   2795   2800

Leu Leu Asn Pro Val Thr Gly Lys Pro Arg Ser Pro Thr Pro Phe His
        2805   2810   2815

Ile Asp Phe Pro Pro Asp Ala Asp Cys Ala Ser Leu Met Arg Ala Cys
      2820   2825   2830

Ala Ser Leu Ala Lys His Phe Asp Ile Phe Arg Thr Val Phe Leu Glu
     2835   2840   2845

Ala Arg Gly Glu Leu Tyr Gln Val Val Leu Lys His Val Asp Val Pro
    2850   2855   2860

Ile Glu Met Leu Gln Thr Glu Glu Asn Ile Asn Ser Ala Thr Arg Ser
865   2870   2875   2880

Phe Leu Asp Val Asp Ala Glu Lys Pro Ile Arg Leu Gly Gln Pro Leu
      2885   2890   2895

Ile Arg Ile Ala Ile Leu Glu Lys Pro Gly Ser Thr Leu Arg Val Ile
         2900   2905   2910

Leu Arg Leu Ser His Ala Leu Tyr Asp Gly Leu Ser Leu Glu His Ile
         2915   2920   2925

Leu His Ser Leu His Ile Leu Phe Phe Gly Gly Ser Leu Pro Pro Pro
      2930   2935   2940

Pro Lys Phe Ala Gly Tyr Met Gln His Val Ala Ser Ser Arg Arg Glu
945   2950   2955   2960

Gly Tyr Asp Phe Trp Arg Ser Val Leu Arg Asp Ser Ser Met Thr Val
             2965   2970   2975

Ile Lys Gly Asn Asn Asn Thr Thr Pro Pro Pro Pro Pro Gln Gln Gln
         2980   2985   2990

Ser Thr Pro Ser Gly Ala His His Ala Ser Lys Val Val Thr Ile Pro
         2995   3000   3005

Thr Gln Ala Asn Thr Asp Ser Arg Ile Thr Arg Ala Thr Ile Phe Thr
      3010   3015   3020

Thr Ala Cys Ala Leu Met Leu Ala Lys Glu Asp Asn Ser Ser Asp Val
025   3030   3035   3040

Val Phe Gly Arg Thr Val Ser Gly Arg Gln Gly Leu Pro Leu Ala His
          3045   3050   3055

Gln Asn Val Ile Gly Pro Cys Leu Asn Gln Val Pro Val Arg Ala Arg
          3060   3065   3070

Gly Leu Asn Arg Gly Thr Thr His His Arg Glu Leu Leu Arg Glu Met
          3075   3080   3085

Gln Glu Gln Tyr Leu Asn Ser Leu Ala Phe Glu Thr Leu Gly Tyr Asp
        3090   3095   3100

Glu Ile Lys Ala His Cys Thr Asp Trp Pro Asp Val Pro Ala Thr Ala
105   3110   3115   3120

Ser Phe Gly Cys Cys Ile Val Tyr Gln Asn Phe Asp Ser His Pro Asp
          3125   3130   3135

Ser Arg Val Glu Glu Gln Arg Leu Gln Ile Gly Val Leu Ser Arg Asn
          3140   3145   3150

Tyr Glu Ala Ile Asn Glu Gly Leu Val His Asp Leu Val Ile Ala Gly
          3155   3160   3165

Glu Ser Glu Pro Asp Gly Asp Asp Leu Arg Val Thr Val Val Ala Asn
          3170   3175   3180

Arg Arg Leu Cys Asp Glu Glu Arg Leu Lys Arg Met Leu Glu Glu Leu
185   3190   3195   3200

Cys Gly Asn Ile Arg Ala Leu Ala Leu Val
                3205   3210

<210> 3
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
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<400> 3
Trp Thr Ser Met Tyr Asp Gly
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<210> 4
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Val Val Gln Tyr Phe Pro Thr
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synthetase gene

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synthetase gene

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gcggaattaa ccctcactaa agggaacgaa   30

<210> 8

<211> 30

<212> DNA

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<223> Description of Artificial Sequence:primer for cyclic depsipeptide synthetase gene

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gcgtaatacg actcactata gggcgaagaa   30

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<212> DNA

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<210> 11

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gcatcgcgat actagagaag   20

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<212> DNA

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<223> Description of Artificial Sequence:primer for Abp1 gene

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ctcaaaccag gaactctttc   20

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<213> Artificial Sequence

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ggggaattcg tgggtggtga tatcatggc   29

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gggggatcct tgatgggttt tggg   24

<210> 18

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ggggggatcct aaactcccat ctatagc   27

<210> 19

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gggtctagac gactcattgc agtgagtgg   29

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